ILLINOIS ENVIRONMENTAL PROTECTION AGENCY MEMORANDUM

DATE: August 9, 1983

TO: Land Division File

FROM: Rick Hersemann RAH, DLPC/FOS-Central Region

SUBJECT: LPC #04180801 - DOUGLAS COUNTY - TUSCOLA/CABOT CORPORATION
SUBPART F

An inspection of the Cabot Corporation facility in Tuscola, Illinois, was conducted on August 9, 1983. Those present during the inspection included Mr. Gabriel Paci, Technical Service--Quality Assurance Manager; Mr. Marcus Riney, I.E.P.A. Intern; and Mr. Rick Hersemann, I.E.P.A., DLPC/FOS.

The purpose of the inspection was to check Cabot Corporation's (Cabot) compliance with Subpart F Interim Status Standards for groundwater monitoring. Cabot has a two-cell surface impoundment, excavated into glacial tills, which accepts D002 (corrosive) wastewater. The wastewater contains one to four percent hydrochloric acid. The wastewater enters the surface impoundment from the west through underground pipelines. The wastewater flows east through the surface impoundment to a sump located at the east end. The wastewater is pumped from the sump through underground pipelines to a deep injection well. The wastewater is injected under pressure through the disposal well into the Eminence-Potosi dolomite formation, approximately one mile below the ground surface. The wastewater is neutralized by the dolomites in the Eminence-Potosi Formation.

In addition to the hydrochloric acid wastewater, several other wastewaters generated at the facility are placed into the surface impoundment for disposal down the deep injection well. These wastes are: rainfall runoff from diked areas around product storage tanks, leachate collected from past disposal areas, acids from spills, and washings from the silane waste treatment scrubber and storage tanks. Prior to 1981, wastes generated at A. E. Staley Manufacturing Company of Decatur and R. R. Donnelley Company of Mattoon were deposited into the surface impoundment for disposal through the deep injection well. According to Mr. Paci, the wastewater accepted from R. R. Donnelley contained organic constituents.

The following information provides clarification and more detail to the Subpart F inspection checklists. Items are referenced to specific questions of Appendix A-1 and Appendix B checklists. Checklist items which are self-explanatory are not referenced. Checklist items needing clarification or more detail are referenced to the specific question's number.

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APPENDIX A-1

2. Cabot has implemented a groundwater monitoring program which consists of one upgradient and three downgradient monitor wells screened in the uppermost aquifer underlying the facility.

3. The upgradient monitor well (MW 1) is located 400 feet west of the surface impoundment.

4. Downgradient monitor well MW-3 is located 250 feet north of the surface impoundment. MW-2 is located 50 feet south of the surface impoundment. MW-4 is located 550 feet east of the surface impoundment.

5a) Cabot is not a multiple hazardous waste management component, 5a) does not apply.

7. Monitor wells have PVC casings with 2-inch inside diameters. The wells are screened from 10 feet below ground level (top) to 30 feet below ground level (bottom). The annulus area around the screen is filled with quartz sand. The annulus is sealed with cement/bentonite grout from the top of the screen to the ground surface.

8. Cabot has developed and implemented a groundwater sampling and analysis plan. Information in the plan has been submitted to the Agency.

9. Cabot has sampled for the parameters required in 725.192(b)(1), 725.192(b)(2), and 725.192(b)(3). Copies of the analysis results were on file at the facility. Copies of the analysis results have also been submitted to the Agency. Cabot just completed their first year of monitoring so 9b) does not apply at this time. Groundwater surface elevations were not evaluated annually to determine whether the monitoring wells are properly placed. According to Mr. Paci this evaluation will be made soon. (Evaluation submitted in 9/14/83 letter to Agency)

10. Cabot has prepared an outline of a groundwater quality assessment program. Mr. Paci felt that the sample results from the first year of monitoring would show a significant decrease in pH in monitor well MW-2. Mr. Paci said that Cabot would probably implement a groundwater quality assessment program. He stated that Rauf Piskin, Hydrogeologist, has been hired by Cabot to conduct the assessment program.

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14. Cabot has submitted analysis results for the first year of monitoring to the Agency. Evaluations required under 725.193(b) and 725.193(f) will be made now that the first year of monitoring is complete.

APPENDIX B

1.2 Cabot has prepared an outline of a groundwater quality assessment program. Cabot will probably implement a groundwater quality assessment program when the first year of sample results have been evaluated.

2.1 Cabot has an aerial photo, scale 1 inch = 2000 feet, and a map prepared by Bruce Yare & Associates, scale 1 inch = 200 feet in the groundwater monitoring program. The topography at the facility is flat farmland. Significant topographic features in the area are the Kaskaskia River, surface impoundments, and waste gypsum piles at the U. S. Industrial Chemical plant to the west. Cabot has 2 deep injection wells and USI has one deep injection well which inject wastewater with low pH's into the Eminence-Potosi dolomite formation.

2.2 Cabot does not have a regional hydrogeologic map showing groundwater flow direction, areas of recharge/discharge, and potentiometric contours in their groundwater monitoring program.

2.3 Cabot's plot plan consists of the two maps previously mentioned in 2.1. Cabot is not a multi-component hazardous waste facility, questions under 2.3.4 do not apply.

2.4 Cabot does not have a site water table (potentiometric) contour map included in the groundwater monitoring program. This map is needed to evaluate the location of the monitor wells in the groundwater monitoring program. Upgradient well MW-1 is located 400 feet west of the surface impoundment and appears capable of providing representative ambient groundwater quality data.

3.1 Soil borings and monitor wells were drilled and installed by Shaffer-Krimmel-Silver of Decatur, Illinois, under the supervision of Bruce Yare and Associates of Belleville, Illinois.

3.3 Eight soil borings were made by hollow stem auger for RCRA compliance. Monitor wells were installed in each of the eight borings. All soil borings were drilled approximately 30 feet deep.

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3.5 Lithologic samples were collected during the drilling by split spoon and shelby tube sampling. It is unknown at what interval the samples were collected.

4.2 Four monitor wells (MW-1, MW-2, MW-3, and MW-4) are currently being monitored for RCRA Compliance. An additional four monitor wells were installed closer to the surface impoundment to determine if the surface impoundment is leaking.

4.3 Well construction information is provided in Table B-2. Well construction data for the four wells installed next to the surface impoundment was not available. Wells were constructed with 2-inch diameter threaded PVC casing. Well screens are packed with quartz sand. The annular spaces are sealed with a cement bentonite grout approximately 8.5 feet thick. The wells have protective steel standpipes cemented in place. The wells do not have locking caps. The wells were developed by pumping with a peristaltic pump.

5.1 Geologic cross-sections of the surface impoundment were not included in the groundwater monitoring program. The depth of the surface impoundment is approximately 10 feet deep.

5.2 Cabot's facility is underlain by several hundred feet of glacial tills. Permeability of the tills range from 1.1×10^{-8} to 7.5×10^{-9} cm/sec. The uppermost saturated zone is sand lenses within the glacial till clay and silt.

5.3 Static water levels are measured using a steel tape. Seasonal fluctuations in the static water levels occur which should not alter groundwater gradients and flow directions. Groundwater should flow radially from the surface impoundment's recharge mound in all directions. Regional groundwater flow has been determined to be to the northeast.

5.4 Aquifer hydraulic properties were determined by falling head tests and soil permeability tests conducted in the laboratory. The falling head tests showed the horizontal soil permeability to range from 5.8×10^{-5} to 6.6×10^{-5} cm/sec. Vertical permeability determined from laboratory tests ranged from 1.1×10^{-8} to 7.5×10^{-9} cm/sec.

6.1 Monitor wells are screened in the upper portion of the uppermost aquifer underlying the facility.

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7.2 Monitor wells are sampled by a peristaltic pump. Each monitor well has a designated tygon tube which connects to the sampling pump. This eliminates cross contamination of samples.

8.0 Samples are collected and placed in the proper preservation bottles. Samples are delivered to the proper laboratory along with a lab sheet containing the proper chain-of-custody control. Samples are refrigerated until time of analysis.

9.1 Sample analysis is performed by Cabot's laboratory in Tuscola, Illinois; Daily Analytical Laboratory in Peoria, Illinois; and Environmental Laboratory, Inc. in Gulfport, Mississippi.

9.7 Information from field activity logs is recorded on the chain-of-custody control form for each sample collected. Copies of all laboratory results were on file.

9.8 Statistical analyses are planned for all water quality results when the first year of monitoring is complete. The Student's t-test will be utilized. Copies of analysis reports have been submitted to IEPA-DLPC/Compliance Monitoring.

10.0 Site verification of Cabot's facility was made on July 27, 1983, by physically inspecting the area around the surface impoundment. The surface impoundment and monitor wells were checked for verification. All items correspond to the plot plan.

Cabot's two-celled surface impoundment is composed of a north cell and a south cell. The north cell, which was not being used, contained some water from rainfall. The south cell was in operation and contained 6 to 7 feet of wastewater. Both cells are approximately 10 feet deep. Both cells are bermed and elevated above the ground level of the surrounding area. The berms around the surface impoundment are covered with gravel. The elevated surface impoundment acts as a recharge zone to the shallow groundwater. The deep injection well, associated with the surface impoundment, was in operation.

SUMMARY

Cabot's groundwater monitoring program has several deficiencies which place it in non-compliance with the 35 Illinois Administrative Code, Part 725.191 and Part 725.193, of Subpart F--Groundwater Monitoring.

To comply with 725.191, more geologic information is needed concerning the surface impoundment and its affect on the uppermost aquifer underlying the facility. Information needed for evaluation includes:

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1. Geologic cross-sections of facility

2. Site Water Table (Potentiometric) contour map showing:

   a. Groundwater contour lines
   b. Groundwater flow directions
   c. Static Water Levels
   d. Areas of recharge/discharge
   e. Location of surface impoundment
   f. Location of monitor wells

At the time of the inspection, Cabot had not complied with 725.193(f) which requires that groundwater surface elevations be evaluated annually to determine whether the requirements under 725.191(a) for locating the monitor wells continues to be satisfied. This evaluation was prepared by Dr. Rauf Piskin and submitted by Cabot to the Agency in a September 14, 1983, letter to DLPC/Compliance Monitoring. The evaluation states that monitor wells MW-3 and MW-4 no longer serve as downgradient wells. As required under 725.193(f), the owner/operator must immediately modify the number, location, or depth of the monitoring wells to bring the groundwater monitoring system into compliance with 725.191(a). This requirement has not been met. Cabot's September 14, 1983, letter states that the information required will be submitted to the Agency as a supplement to the annual report. No date was given for when this information will be submitted.

Cabot has just completed their first year of monitoring. Concentrations or values of parameters used as indicators of groundwater contamination for each well, along with the evaluations required under 725.193(b), will have to be made.

RAH/cp

Attachments

cc: DLPC/FOS, Central Region (2)
DLPC/Compliance Monitoring

Douglas County - LPC # 04180801
Tuscola / Cabot Corp.

APPENDIX A-1

FACILITY INSPECTION FORM FOR COMPLIANCE WITH INTERIM STATUS STANDARDS COVERING GROUND-WATER MONITORING

Company Name: Cabot Corporation; IEPA I.D. Number: LPC # 04180801

Company Address: P.O. Box 188; USEPA I.D. Number: 042075333

Tuscola, IL 61953 Inspector's Name: Rick Hersemann

Company Contact/Official: Gabriel Paci; Branch/Organization: _____

Title: Manager - Technical Service; Date of Inspection: August 9, 1983
Quality Assurance
Regulatory Compliance

	Yes	No	Unknown	Wavied
Type of facility: (check appropriately)				
a) surface impoundment	X	___		
b) landfill	___	___		
c) land treatment facility	___	___		
d) disposal waste pile*	___	___		
Ground-Water Monitoring Program				
1. Was the ground-water monitoring program reviewed prior to site visit?	X	___		
If "No,"				
a) Was the ground-water program reviewed at the facility prior to site inspection?	___	___		
2. Has a ground-water monitoring program (capable of determining the facility's impact on the quality of groundwater in the uppermost aquifer underlying the facility) been implemented? 725.190(a)	X	___	___	___

*Listed separate from landfill for convenience of identification.

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	Yes	No	Unknown	Wavied
3. Has at least one monitoring well been installed in the uppermost aquifer hydraulically upgradient from the limit of the waste management area? 725.191(a)(1)	X			
a) Are ground-water samples from the uppermost aquifer, representative of background ground-water quality and not affected by the facility (as ensured by proper well number, locations and depths?)	X			
4. Have at least three monitoring wells been installed hydraulically downgradient at the limit of the waste handling or management area? 725.191(a)(2)	X			
a) Do well numbers, locations and depths ensure prompt detection of any statistically significant amounts of hazardous waste or hazardous waste constituents that migrate from the waste management area to the uppermost aquifer?	X			
5. Have the locations of the waste management areas been verified to conform with information in the ground-water program?	X			
a) If the facility contains multiple waste management components, is each component adequately monitored?		X		
6. Do the numbers, locations, and depths of the ground-water monitoring wells agree with the data in the ground-water monitoring system program? If "No," explain discrepancies.	X			
7. Well completion details. 725.191(c)				
a) Are wells properly cased?	X			
b) Are wells screened (perforated) and packed where necessary to enable sampling at appropriate depths?	X			
c) Are annular spaces properly sealed to prevent contamination of ground-water?	X			

	Yes	No	Unknown	Wavied
8. Has a ground-water sampling and analysis plan been developed? 725.192(a)	X			
a) Has it been followed?	X			
b) Is the plan kept at the facility:	X			
c) Does the plan include procedures and techniques for:				
1) Sample collection?	X			
2) Sample preservation?	X			
3) Sample shipment?	X			
4) Analytical procedures?	X			
5) Chain of custody control?	X			
9. Are the required parameters in ground-water samples being tested quarterly for the first year? 725.192(b) and 725.192(c)(1)	X			
a) Are the ground-water samples analyzed for the following:				
1) Parameters characterizing the suitability of the ground-water as a drinking water supply? 725.192(b)(1)	X			
2) Parameters establishing ground-water quality? 725.192(b)(2)	X			
3) Parameters used as indicators of ground-water contamination? 725.192(b)(3)	X			
(i) For each indicator parameter are at least four replicate measurements obtained at each upgradient well for each sample obtained during the first year of monitoring? 725.192(c)(2)	X			
(ii) Are provisions made to calculate the initial background arithmetic mean and variance of the respective parameter concentrations or values obtained from the upgradient well(s) during the first year? 725.192(c)(2)	X			

	Yes	No	Unknown	Wavied	
b) For facilities which have completed first year ground-water sampling and analysis requirements:					
1) Have samples been obtained and analyzed for the ground-water quality parameters at least annually? 725.192(d)(1)	NA				Facility is on last quarter of first year sampling.
2) Have samples been obtained and analyzed for the indicators of ground-water contamination at least semi-annually? 725.192(d)(2)	NA				
c) Were ground-water surface elevations determined at each monitoring well each time a sample was taken? 725.192(e)	X				
d) Were the ground-water surface elevations evaluated annually to determine whether the monitoring wells are properly placed? 725.193(f)		X			
e) If it was determined that modification of the number, location or depth of monitoring wells was necessary, was the system brought into compliance with 725.191(a)? 725.193		X			
10. Has an outline of a ground-water quality assessment program been prepared? 725.193(a)	X				
a) Does it describe a program capable of determining:					
1) Whether hazardous waste or hazardous waste constituents have entered the ground-water?	X				
2) The rate and extent of migration of hazardous waste or hazardous waste constituents in ground-water?	X				
3) Concentrations of hazardous waste or hazardous waste constituents in ground-water?	X				
b) After the first year of monitoring, have at least four replicate measurements of each indicator parameter been obtained for samples taken for each well? 725.193(b)		X			First year of Sampling just completed

	Yes	No	Unknown	Wavied
1) Were the results compared with the initial background means from the upgradient well(s) determined during the first year?	___	X		
(i) Was each well considered individually?	___	X		
(ii) Was the Student's t-test used (at the 0.01 level of significance)?	___	X		
2) Was a significant increase (or pH decrease as well) found in the:				
(i) Upgradient wells	___	X		
(ii) Downgradient wells	___	X		
If "Yes," Compliance Checklist A-2 must also be completed.				
11. Have records been kept of analyses for parameters in 725.192(c) and (d)? 725.194(a)(1)	X	___		
12. Have records been kept of ground-water surface elevations taken at the time of sampling for each well? 725.194(a)(1)	X	___		
13. Have records been kept of required elevations in 725.192(e)? 725.194(a)(1)	X	___		
14. Have the following been submitted to the Director 725.194(a)(2):*				
a) Initial background concentrations of parameters listed in 725.192(b) within 15 days after completing each quarterly analysis required during the first year?	X	___		
b) For each well, have any parameters whose concentrations or values have exceeded the maximum contaminant levels allowed in drinking water supplies been separately identified?	___	X		

*EPA will be proposing (Spring 1982) to replace this reporting requirement with an exception reporting system where reports will be submitted only where maximum contaminant levels or significant changes in the contamination indicators or other parameters are observed. EPA has delayed compliance stage for 14 a) above until August 1, 1982 (Federal Register, February 23, 1982, p. 7841-7842) to be coupled with exception reporting in the interim.

	Yes	No	Unknown	Wavied
c) Annual reports including:				
1) Concentrations or values of parameters used as indicators of ground-water contamination for each well along with required evaluations under 725.193(b)?	___	X		
2) Any significant differences from initial background values in up-gradient wells separately identified?	___	X		
3) Results of the evaluation of ground-water surface elevations?	___	X		

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Tuscola / Cabot Corp.

APPENDIX B

GROUND-WATER MONITORING AND ALTERNATE SYSTEM
TECHNICAL INFORMATION FORM

1.0 Background Data:

Company Name: Cabot Corporation ; EPA I.D.#: 042075333

Company Address: P.O. Box 188
Tuscola, IL. 61953

Inspector's Name: Rick Hersemann ; Date: August 9, 1983

1.1 Type of facility (check appropriately):

1.1.1	surface impoundment	X
1.1.2	landfill	
1.1.3	land treatment facility	
1.1.4	disposal waste pile	

1.2 Has a ground-water monitoring system been established? (Y/N) Y

1.2.1 Is a ground-water quality assessment program outlined or proposed? (Y/N) Y

If Yes,

1.2.2 Was it reviewed prior to the site visit? (Y/N) Y

1.3 Has a ground-water quality assessment program been implemented or proposed at the site? (Y/N) N

If yes, Appendix C, Ground-Water Quality Assessment Program Technical Information Form must be utilized also.

2.0 Regional/Facility Map(s)

2.1 Is a regional map of the area, with the facility delineated, included? (Y/N) Y

If yes,

2.1.1 What is the origin and scale of the map? Aerial Photo 1" = 2000'
Map by Bruce Yare & Associates 1" = 200'

2.1.2 Is the surficial geology adequately illustrated? (Y/N) Y

2.1.3 Are there any significant topographic or surficial features evident? (Y/N) Y

If yes, describe Kaskaskia River to west - surface impoundments and waste gypsum piles at USI - west

2.1.4 Are there any streams, rivers, lakes, or wet lands near the facility? (Y/N) Y

If yes, indicate approximate distances from the facility Kaskaskia River - 8000 ft. west
USI Surface Impoundments - 3000 to 4,000 feet to west

2.1.5 Are there any discharging or recharging wells near the facility? (Y/N) N

If yes, indicate approximate distances from the facility. 2 Waste disposal wells are located onsite at Cabot Corp. and 1 waste disposal well is located at USI

2.2 Is a regional hydrogeologic map of the area included? (This information may be shown on 2.1) (Y/N) N

If yes:

2.2.1 Are major areas of recharge/dishcarge shown? (Y/N) N

If yes, describe.

2.2.2 Is the regional ground-water flow direction indicated? (Y/N) N

2.2.3 Are the potentiometric contours logical? (Y/N) N
If not, explain.

2.3 Is a facility plot plan included? (Y/N) Y

2.3.1 Are facility components (landfill areas, impoundments, etc.) shown? (Y/N) Y

2.3.2 Are any seeps, springs, streams, ponds, or wetlands indicated? (Y/N) N

2.3.3 Are the locations of any monitoring wells, soil borings, or test pits shown? (Y/N) Y

2.3.4 Is the facility a multi-component facility? (Y/N) N

If yes:

2.3.4.1 Are individual components adequately monitored? (Y/N) —

2.3.4.2 Is a Waste Management Area delineated? (Y/N) —

2.4 Is a site water table (potentiometric) contour map included? (Y/N) N

If yes,

2.4.1 Do the potentiometric contours appear logical based on topography and presented data? (Consult water level data) (Y/N) None shown

2.4.2 Are groundwater flowlines indicated? (Y/N) N

2.4.3 Are static water levels shown? (Y/N) N

2.2.4 May hydraulic gradients be estimated? (Y/N) N

2.4.5 Is at least one monitoring well located hydraulically upgradient of the waste management area(s)? (Y/N) Y

2.4.6 Are at least three monitoring wells located hydraulically downgradient of the waste management area(s)? (Y/N) Y

2.4.7 By their location, do the upgradient wells appear capable of providing representative ambient groundwater quality data? (Y/N) Y

If no, explain. _____

_____

_____

3.0 Soil Boring/Test Pit Details

3.1 Were soil borings/test pits made under the supervision of a qualified professional? (Y/N) Y

If yes,

3.1.1 Indicate the individual(s) and affiliation(s):
Bruce Yare and Associates
Belleville, Illinois

3.1.2 Indicate the drilling/excavating contractor, if known
Shaffer - Krimmel - Silver - Decatur, IL.

3.2 If soil borings/test pits were made, indicate the method(s) of drilling/excavating:

- Auger (hollow or solid stem) X
- Mud rotary
- Air rotary
- Reverse rotary
- Cable tool
- Jetting
- Other, including excavation (explain)

3.3 List the number of soil borings/test pits made at the site

3.3.1 Pre-existing —

3.3.2 For RCRA compliance 8

3.4 Indicate borehole diameters and depths (if different diameters and depths use TABLE B-1).

3.4.1 Diameter: 7 inch diameter

3.4.2 Depth: See Table B-1

3.5 Were lithologic samples collected during drilling? (Y/N) Y

If yes,

3.5.1 How were samples obtained? (Check method(s))

- Split spoon X
- Shelby tube, or similar X
- Rock coring
- Ditch sampling
- Other (explain)

INFORMATION TABLE B-1

BORING NO.	DEPTH	DIAMETER
mw 1	31.3 Ft.	7 in.
mw 2	31.4 Ft.	7 in.
mw 3	29.8 Ft.	7 in.
mw 4	30.5 Ft.	7 in.

3.5.2 At what interval were samples collected? Unknown

3.5.3 Were the deposits or rock units penetrated described? (boring logs, etc.) (Y/N) Y

3.6 If test pits were excavated at the site, describe procedures. None Excavated

4.0 Well Completion Detail

4.1 Were the wells installed under the supervision of a qualified professional? (Y/N) Y

If yes:

4.1.1 Indicate the individual and affiliation, if known
Bruce Yare & Associates
Belleville, Illinois

4.1.2 Indicate the well construction contractor, if known
Shaffer-Krimmel-Silver
Decatur, Illinois

4.2 List the number of wells at the site

4.2.1 Pre-existing –

4.2.2 For RCRA Compliance 8

4.3 Well construction information (fill out INFORMATION TABLE B-2)

4.3.1 If PVC well screen or casing is used, are joints (couplings):

- Glued on
- Screwed on X

4.3.2 Are well screens sand/gravel packed? (Y/N) Y

INFORMATION TABLE B-2

* Elevations from plant reference datum

	WELL NO.	mw-1	mw-2	mw-3	mw-4		
	GROUND ELEVATION	122.8	120.0	116.3	120.2		
	TOTAL DEPTH	31.3	31.4	29.8	30.5		
WELL CASING	TYPE MATERIAL	PVC	PVC	PVC	PVC		
	DIAMETER	2 in.	2 in.	2 in.	2 in.		
	LENGTH	34.3	34.4	32.8	33.5		
	STICK-UP	3.0	3.0	3.0	3.0		
	TOP ELEVATION	125.8	123.0	119.3	123.2		
	BOTTOM ELEVATION	91.5	88.6	86.5	89.7		
WELL SCREEN	DEPTH TOP/BOTTOM	11.4 / 31.3	11.4 / 31.4	10.0 / 29.8	10.6 / 30.5	/	/
	TYPE MATERIAL	PVC	PVC	PVC	PVC		
	DIAMETER	2 in	2 in	2 in	2 in		
	LENGTH	20.0 FT	20.0 FT	20.0 FT	20.0 FT		
	SLOT SIZE	10	10	10	10		
	TOP ELEVATION	101.5	108.6	106.5	109.7		
	BOTTOM ELEVATION	91.5	88.6	86.5	89.7		
OPEN HOLE OR SAND/GRAVEL PACK	DEPTH TOP/BOTTOM	/	/	/	/	/	/
	DIAMETER						
	LENGTH						
	TOP ELEVATION						
	BOTTOM ELEVATION						

4.3.3 Are annular spaces sealed? (Y/N) Y

If yes, describe:

- bentonite slurry X
- Cement grout X
- Other (explain) _____

- Thicknesses of seals ≈ 8.5 Feet

4.3.4 If "open hole" wells, are the cased portions sealed in place? (Y/N) _____

If yes, describe how: NONE INSTALLED

4.3.5 Are there cement surface seals? (Y/N) Y

If yes,

- How thick? ≈ 1-2 Feet

4.3.6 Are the wells capped? (Y/N) Y

If yes,

- Do they lock? (Y/N) N

4.3.7 Are protective standpipes cemented in place? (Y/N) Y

4.3.8 Were wells developed? (Y/N) Y

If yes, check appropriate method(s):

- Air lift pumping X
- Pumping and surging _____
- Jetting _____
- Bailing _____
- Other (explain) _____

5.0 Aquifer Characterization

5.1 Has the extent of the uppermost saturated zone (aquifer) in the facility area been defined? (Y/N) Y

If yes,

5.1.1 Are soil boring/test pit logs included? (Y/N) Y

5.1.2 Are geologic cross-sections included? (Y/N) N

5.2 Is there evidence of confining (low permeability) layers beneath the site? (Y/N) Y

If yes,

5.2.1 Is the areal extent and continuity indicated? (Y/N) Y

5.2.2 Is there any potential for saturated conditions (perched water) to occur above the uppermost aquifer? (Y/N) N

If yes, give details: _____

a) Should or is this perched zone being monitored? (Y/N) NA

Explain _____

5.2.3 What is the lithology and texture of the uppermost saturated zone (aquifer)? _____

Clay / Silt with Sand Lenses

5.2.4 What is the saturated thickness, if indicated? _____

NOT INDICATED

5.3 Were static water levels measured? (Y/N) Y

If yes,

5.3.1 How were the water levels measured (check method(s)).

- Electric water sounder ____
- Wetted tape ____
- Air line ____
- Other (explain) _____

Steel Tape

5.3.2 Do fluctuations in static water levels occur? (Y/N) Y

If yes,

5.3.2.1 Are they accounted for (e.g. seasonal, tidal, etc.)? (Y/N) Y

If yes, describe: Seasonal

5.3.2.2 Do the water level fluctuations alter the general ground-water gradients and flow directions? (Y/N) N

If yes,

5.3.2.3 Will the effectiveness of the wells to detect contaminants be reduced? (Y/N) N

Explain _____

_____

_____

5.3.2.4 Based on water level data, do any head differentials occur that may indicate a vertical flow component in the saturated zone? (Y/N) N

If yes, explain Horizontal flow moves radially from the impoundments

_____

5.4 Have aquifer hydraulic properties been determined? (Y/N) Y

If yes,

5.4.1 Indicate method(s):

- Pumping tests ____
- Falling/constant head tests X
- Laboratory tests (explain) X - Permeabilities

_____

_____

5.4.2 If determined, what are the values for:

- Transmissivity ____
- Storage coefficient ____
- Leakage ____
- Permeability (Average Vertical) - 8.25×10^{-9}
- Porosity ____
- Specific capacity ____

5.4.3 In cases where several tests were undertaken, were discrepancies in the results evident? (Y/N) N

If yes, explain _____

_____

5.4.4 Were horizontal ground-water flow velocities determined? (Y/N) N

If yes, indicate rate of movement _____

_____

6.0 Well Performance

6.1 Are the monitoring wells screened in the uppermost aquifer? (Y/N) Y

6.1.1 Is the full saturated thickness screened? (Y/N) N

6.1.2 For single completions, are the intake areas in the: (check appropriate levels)

- Upper portion of the aquifer X
- Middle of the aquifer ____
- Lower portion of the aquifer ____

6.1.3 For well clusters, are the intake areas open to different portions of the aquifer? (Y/N) NA

6.1.4 Do the intake levels of the monitoring wells appear to be justified due to possible contaminant density and groundwater flow velocity? (Y/N) Y

7.0 Ground-Water Quality Sampling

7.1 Is a sampling (groundwater quality) program and schedule included? (Y/N) Y

7.2 Are sample collection field procedures clearly outlined? (Y/N) Y

7.2.1 How are samples obtained: (check method(s))

- Air lift pump ____
- Submersible pump ____
- Positive displacement pump ____
- Centrifugal pump ____
- Peristaltic or other suction-lift pump X
- Bailer ____
- Other (describe) ____

7.2.2 Are all wells sampled with the same equipment and procedures? (Y/N) Y

If no, explain ____

7.2.3 Are adequate provisions included to clean equipment after sampling to prevent cross-contamination between wells? (Y/N) Y

7.2.4 Are organic constituents to be sampled? (Y/N) Y

If yes,

7.2.4.1 Are samples collected with equipment to minimize absorption and volatilization? (Y/N) Y

If yes,

Describe equipment Designated hose per each monitor well. Seperate sample bottles for organic constituents

8.0 Sample Preservation and Handling

8.1 Have appropriate sample preservation and preparation procedures been followed (filtration and preservation where appropriate)? (Y/N) Y

8.2 Are samples refrigerated? (Y/N) Y

8.3 Are EPA recommended sample holding period requirements adhered to? (Y/N) Y

8.4 Are suitable container types used? (Y/N) Y

8.5 Are provisions made to store and ship samples under cold conditions (ice packs, etc.)? (Y/N) Y

8.6 Is a chain of custody control procedure clearly defined? (Y/N) Y

8.7 Is a specific chain of custody form illustrated? (Y/N) Y

If yes,

8.7.1 Will this form provide an accurate record of sample possession from the moment the sample is taken until the time it is analyzed? (Y/N) Y

9.0 Sample Analysis and Record Keeping

9.1 Is sample analysis performed by a qualified laboratory? (Y/N) Y

Indicate lab Cabot LAB, Daily Analytical Lab, Environmental LAB, Inc.

9.2 Are analytical methods described in the records? (Y/N) Y

9.2.1 Are analytical methods acceptable to EPA? (Y/N) Y

9.3 Are the required drinking water suitability parametters tested for? (Y/N) Y

9.4 Are the required groundwater quality parameters tested for? (Y/N) Y

9.5 Are the required groundwater contamination indicator parameters tested for? (Y/N) Y

9.6 Are any analytical parameters determined in the field? (Y/N) N

Identify:

- pH ____
- Temperature ____
- Specific conductance ____
- Other (describe) ____

9.7 Is a plan included to record information about each sample collected during the groundwater monitoring program? (Y/N) Y

9.7.1 Are field activity logs included? (Y/N) Y

9.7.2 Are laboratory results included? (Y/N) Y

9.7.3 Are field procedures recorded? (Y/N) Y

9.7.4 Are field parameter determinations included? (Y/N) N

9.7.5 Are the names and affiliation of the field personnel included? (Y/N) Y

9.8 Are statistical analyses planned or shown for all water quality results where necessary? (Y/N) Y

9.8.1 Is an analysis program set-up which adheres to EPA guidelines? (Y/N) Y

9.8.2 Is Student's t-test utilized? (Y/N) Y
If other evaluation procedure used, identify ____

9.8.3 Are provisions made for submitting analysis reports to the Regional Administrator? (Y/N) Y

10.0 Site Verification

10.1 Plot Plan indicating the locations of various facility components, ground-water monitoring wells, and surface waters? (Y/N Y)

10.1.1 Is the plot plan used for the inspection the same as in the monitoring program plan documentation? (Y/N) Y

If not, explain ____

10.1.2 Are all of the components of the facility identified during the inspection addressed in the monitoring program documentation? (Y/N) Y

If not, explain _____

_____

10.1.3 Are there any streams, lakes or wetlands on or adjacent to the site? (Y/N) Y

If yes, indicate distances from waste management areas _____

Kaskaskia River - 8000 ft - west

USE Surface Impoundments - 3000 - 4000 Ft. West

10.1.4 Are there any signs of water quality degradation evident in the surface water bodies? (Y/N) N

If yes, explain _____

_____

_____

10.1.5 Is there any indication of distressed or dead vegetation on or adjacent to the site? (Y/N) N

If yes, explain _____

_____

_____

10.1.6 Are there any significant topographic or surficial features on or near the site (e.g., recharge or discharge areas)? (Y/N) Y

If yes, explain Storage Pond - recharge area

_____

10.1.7 Are the monitor well locations and numbers in agreement with the monitoring program documentation? (Y/N) Y

If no, explain _____

_____

10.1.7.1 Were locations and elevations of the monitor wells surveyed into some known datum? (Y/N) Y

If not, explain Surveyed into plant reference datum

10.1.7.2 Were the wells sounded to determine total depth below the surface? (Y/N) Y

If not, explain _____

_____

10.1.7.3 Were discrepancies in total depth greater than two feet apparent in any well? (Y/N) N

If yes, explain _____

_____

10.1.8 Was ground water encountered in all monitoring wells? (Y/N) Y

If not, indicate which well(s) were dry _____

_____

10.1.9 Were water level elevations measured during the site visit? (Y/N) Y

If yes, indicate well number and water level elevation _____

_____

If not, explain _____

_____

	DEPTH TO WATER (TOC)	TOTAL DEPTH
MW #1	6.1 Feet	31.3 Feet
MW #2	7.4 Feet	31.4 Feet
MW #3	7.2 Feet	29.8 Feet
MW #4	7.3 Feet	30.5 Feet

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DLPC/FOS - Central Region (2)
DLPC/ Compliance Monitoring
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